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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/939,422	08/24/2001	Jonathan Bernstein	112.222.130	2822

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EXAMINER	
MARTINEZ, JOSEPH P	

ART UNIT	PAPER NUMBER
2873	

DATE MAILED: 01/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/939,422	BERNSTEIN ET AL.	
	Examiner	Art Unit	
	Joseph P. Martinez	2873	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 October 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-84* is/are pending in the application.

4a) Of the above claim(s) *27-41,43-58 and 76-80* is/are withdrawn from consideration.

5)☒ Claim(s) *1-17,23-25,59-66 and 73-75* is/are allowed.

6)☒ Claim(s) *18,19,21,22,26,42,67-69,71 and 81-84* is/are rejected.

7)☒ Claim(s) *20,70 and 72* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 August 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 18 and 19 rejected under 35 U.S.C. 103(a) as being unpatentable over Haeberle et al. (6369400) in view of Neukermans et al. (6467345).

Re claim 18, Haeberle et al. teaches for example in figs. 1A and 1B, a magnetically actuated array apparatus, comprising: an array of devices generally arranged in a plane, each platform device comprising: a platform (1); a gimbal structure (4) for movably supporting said platform about first and second axes (col. 1, ln. 66-67, wherein the office interprets "two degrees of freedom" to disclose movement in a first and second axes); and actuation coils (2) for causing selective movement of said platform about the first and second axes; and an array of magnets (7.1 and 7.2) generally arranged in a plane proximate and parallel to said plane of said platform device array (col. 2, ln. 22-40), with each magnet being associated with one of said platform devices.

But, Haeberle et al. fails to explicitly teach the platform being a mirror having a reflective surface.

However, within the same field of endeavor, Neukermans et al. teaches for example in fig. 5a, a mirror (32) having a reflective surface.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Haeberle et al. with the mirror plate of Neukermans et al. in order to provide a reflective device for use as a scanner.

Re claim 19, Haeberle et al. in view of Neukermans et al. teaches the MEMS array as disclosed above.

But, Haeberle et al. fails to explicitly teach the magnets are arranged in a checkerboard pattern of alternating north and south poles.

However, it would have been obvious to one of ordinary skill in the art at t he time the invention was made to provide a single south pole magnet as opposed to providing two south pole magnets of figs. 1A and 5 since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art. *Howard v. Detroit Stove Works*, 150 U.S. 164 (1893).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Haeberle et al. in view of Neukermans et al. in order to provide a single south pole magnet, thus making a checkerboard pattern of alternating north and south poles in order to reduce the number of parts of south pole magnets.

2. Claims 21, 22 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haeberle et al. (6369400) in view of Neukermans et al. (6467345) in further view of Behin et al. (6593677).

Re claim 42, Haeberle et al. teaches for example in figs. 1A and 1B, a magnetically actuated array apparatus, comprising: an array of devices arranged in a plane, each device comprising: a platform (1); a gimbal structure (4) for movably supporting said platform about first and second axes (col. 1, ln. 66-67, wherein the office interprets "two degrees of freedom" to disclose movement in a first and second axes); actuation coils (2) for causing selective movement of said platform about the first and second axes; and an array of magnets (7.1 and 7.2) arranged in a plane proximate and parallel to said plane of said platform device array (col. 2, ln. 22-40), each magnet being associated with one of said platform devices.

But, Haeberle et al. fails to explicitly teach the platform being a mirror having a reflective surface and means for determining the angular deflection of said mirror about said axes.

However, within the same field of endeavor, Neukermans et al. teaches for example in fig. 5a, a mirror (82) having a reflective surface.

But, Neukermans et al. fails to explicitly teach means for determining the angular deflection of said mirror about said axes.

However, within the same field of endeavor, Behin et al. teaches for example, means for determining the angular deflection of said mirror about said axes (col. 4, ln. 46-52).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Haeberle et al. with the mirror plate of

Neukermans et al. in order to provide a reflective device for use as a scanner and further modify the apparatus of Haeberle et al. in view of Neukermans et al. with the means for determining angular deflection of Behin et al. in order to control the angular position of the rotating element, as taught by Behin et al.

Re claims 21 and 22, Behin et al. further teaches for example, each device further comprises a feedback mechanism for determining the angular deflection of a respective mirror about one of said axes and wherein said feedback mechanism comprises an excitation coil fixed relative to the device and a detection circuit for sensing the relative proximity of one of said coils to said excitation coil (col. 4, ln. 46-52).

3. Claim 26 rejected under 35 U.S.C. 103(a) as being unpatentable over Haeberle et al. (6369400).

Re claim 26, Haeberle et al. teaches for example in figs. 1A and 1B, an array of electromagnetically actuated MEMS devices, comprising: an array of MEMS devices (1), each device comprising at least two coils (2) paired together on a single circuit (1) and being positioned each on a different side of a rotational axis of the device (fig. 1A), the coils together filling an available surface area (col. 3, ln. 42-44); and an array of magnets (7.1 and 7.2) of alternating polarities (N or S) positioned in a plane parallel to a plane containing said array of MEMS devices such that each such device is within a magnetic field containing primarily field lines (8) perpendicular to the plane of said array of MEMS devices.

But, Haeberle et al. fails to explicitly teach MEMs devices arranged in rows and columns and with each coil being wound in opposite directions.

However, Haeberle et al. suggests the MEMs apparatus for use in a variety of different applications including optical beam scanners, integrated optical alignment systems, focusing systems and cameras (col. 8, ln. 59-67 to col. 9, ln. 1-2), wherein there is limited space for MEMs apparatuses and several MEMS apparatuses are needed. Furthermore, it is well known in the art of electromagnets to provide coils wound in opposing directions.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Haeberle et al. to arrange the MEMs apparatuses in rows and columns in order to maximize the space and furthermore, to provide coils wound in opposing directions in order to have the flux through the coils in opposing directions for greater control of the platform.

4. Claims 67-69, 71 and 81-84 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asada et al. (5606447) in view of Haeberle et al. (6369400).

Re claim 67, Asada et al. teaches for example in fig. 10, an electro-magnetically actuated MEMS device, comprising: a mirror having a reflective surface (8); a gimbal frame (5A) for movably supporting said mirror about first and second axes (col. 10, ln. 30-33); a first coil (7B) on the mirror; and a second coil on the gimbal frame (7A), said first and second coils for causing selective movement of said mirror about the first and second axes in the presence of a magnetic field (col. 1, ln. 13-19).

But, Asada et al. fails to explicitly teach a coil substantially filling the area of the mirror covered by the reflective surface.

However, Asada et al. teaches for example in fig. 1, a coil (7) substantially filling the area of the mirror covered by the reflective surface (col. 5, ln. 20-33, wherein the office interprets "high density" to include substantially filling the area).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the embodiments of Asada et al. to teach substantially filling the area of the mirror covered by the reflective surface in order to prevent limiting the drive force, as taught by Asada et al. (col. 5, ln. 16-19).

Re claim 69, Asada et al. teaches for example in fig. 10, an electro-magnetically actuated MEMS device, comprising: a mirror having a reflective surface (8); a gimbal frame (5A) for movably supporting said mirror about first and second axes (col. 10, ln. 30-33); a first coil (7B) on the mirror; and a second coil on the gimbal frame (7A), said first and second coils for causing selective movement of said mirror about the first and second axes in the presence of a magnetic field (col. 1, ln. 13-19); b) an array of magnets (10A-13A and 10B-13B) positioned proximate to said devices for applying the magnetic field, each magnet of said array being associated with one or more of said mirror devices.

But, Asada et al. fails to explicitly teach an array of mirror devices and the coil substantially filling the area of the mirror covered by the reflective surface.

However, Asada et al. teaches for example in fig. 1, a coil (7) substantially filling the area of the mirror covered by the reflective surface (col. 5, ln. 20-33, wherein the office interprets "high density" to include substantially filling the area).

Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide an array of mirror devices, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the embodiments of Asada et al. to provide an array of mirror devices in order to provide x and y axis beam scanning and further teach substantially filling the area of the mirror covered by the reflective surface in order to prevent limiting the drive force, as taught by Asada et al. (col. 5, ln. 16-19).

Re claim 68, Asada et al. further teaches for example in fig. 10, the magnetic field is applied by one or more external magnets (10A-13A and 10B-13B).

Re claim 71, Asada et al. further teaches for example, said magnets have pole perpendicular to a plane on which said array of mirror devices is arranged (col. 2, ln. 4-8, wherein the office interprets the magnetic field produced interacts with the coil above or below it and therefore the poles are perpendicular to a plane on which mirror devices are arranged).

Re claims 81 and 83, Asada et al. teach the apparatus as disclosed above.

But, Asada et al. fails to explicitly teach said first coil is on a side of said mirror opposite said reflective surface.

However, Asada et al. disloses the reflective surface (5) and said first coil (7B) are on the same side of said mirror. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to put said first coil is on a side of said mirror opposite said reflective surface, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Asada et al. to put said first coil is on a side of said mirror opposite said reflective surface in order to versatility in arrangements of the coils.

Re claims 82 and 84, Asada et al. further teaches for example in fig. 10, the reflective surface (5) and said first coil (7B) is on the same side of said mirror (col. 5, ln. 13-16) with the reflective surface generally covering said second coil (fig. 10, wherein the office interprets the reflective surface generally covers said coil).

Allowable Subject Matter

Claims 1-17, 23-25, 59-66 and 72-75 are allowed.

The following is an examiner's statement of reasons for allowance: the prior art taken alone or in combination fails to anticipate or fairly suggest the limitations of the claims, in such a manner that a rejection under 35 USC 102 or 103 would be proper. The prior art fails to teach a combination of all the claimed features as presented in independent claims 1, 12, 23 and 59.

Specifically regarding claims 1, 12 and 59, Haeberle et al. teaches the state of the art of an array of electro-magnetically actuated MEMS devices.

But, Haeberle et al. fails to explicitly teach a mirror, gimbal and first and second coil pairs on the mirror, as claimed.

Specifically regarding claim 23, Haeberle et al. teaches the state of the art of an array of electro-magnetically actuated MEMS devices.

But, Haeberle et al. fails to explicitly teach an array of magnets positioned along a plane parallel to said substrate, said array of magnets including magnets along each row of devices having a pole direction parallel to said substrate, and magnets between each row of devices having a pole direction perpendicular to said substrate such that said devices are within a magnetic field produced by said array of magnets, as claimed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Claims 20, 70, and 72 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Specifically regarding claims 20, 70 and 72, Haeberle et al. teaches the state of the art of an array of electro-magnetically actuated MEMS devices.

But, Haeberle et al. fails to explicitly teach an array of magnets positioned along a plane parallel to said substrate, said array of magnets including magnets along each row of devices having a pole direction parallel to said substrate, and magnets between each row of devices having a pole direction perpendicular to said substrate such that said devices are within a magnetic field produced by said array of magnets, as claimed.

Response to Arguments

Applicant's arguments, see p. 19-21, filed 10-21-04, with respect to claims 1-17, 23-25, 59-66 and 73-75 have been fully considered and are persuasive. The rejection of claims 1-17, 23-25, 59-66 and 73-75 has been withdrawn.

Re applicant's arguments on p. 22, wherein the applicant argues that the prior art does not disclose means for determining the angular deflection, have been considered, but are not persuasive. Neukermans et al. teaches for example, a torsion sensor (83, fig. 5a, col. 11, ln. 23-25).

Applicant's arguments with respect to claims 67-69, 71 and 81-84 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph P. Martinez whose telephone number is 571-272-2335. The examiner can normally be reached on M-F 7:00 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Y. Epps can be reached on 571-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.